

B.E. (Min.) Part-IV 7th Semester Examination, Nov-Dec 2012
Mineral Beneficiation (MN 702)

Full marks: 70

Time: 3 hours

Use separate answerscript for each half.
 Answer all parts of a question in a single place.

FIRST HALF

Answer question no 1 (compulsory) any two questions from the rest in first half.

1. a) What do you mean by comminution?
 b) Explain different laws of comminution.
 c) Draw a line diagram of a suspended spindle type gyratory crusher.
 e) Draw a diagram of a rotary dryer showing different components.
 $1\frac{1}{2} + 3 + 5 + 2\frac{1}{2} = 12$
2. a) What do you mean by grinding?
 b) Explain the motion of the charge in a tumbling Mill.
 c) Fill up the cumulative overflow(%) and Cumulative underflow (%) column in the following table:

Size(mesh)	overflow	Cumulative overflow	Cumulative underflow
60	4.5		
100	13.5		
150	18.0		
200	27.0		
325	37.0		

$$2 + 4\frac{1}{2} + 5 = 11\frac{1}{2}$$

3. Write short notes on :
 - a) Trommel
 - b) Vibrating Screen
 - c) Rotary coal breaker
 - d) Basic advantages of High Rate thickener
$$2\frac{1}{2} + 3 + 3 + 3 = 11\frac{1}{2}$$
4. a) Deduce the expression of efficiency of a screen.
 b) What is 'Cut-point' of a Screen and d_{50} size?

$$9 + 2\frac{1}{2} = 11\frac{1}{2}$$
5. a) What do you mean by Gravity separation?
 b) Explain principles of Jigging.
 c) Draw a Shaking table showing different components.
 d) Write short notes on:
 - Plunger Jig

$$1 + 4 + 3 + 3\frac{1}{2} = 11\frac{1}{2}$$

2ND HALF

Answer question no. 6 and any two from the rests.

6. What is magnetic susceptibility of a mineral? Classify materials according to its magnetic response. What are the requirements for industrial concentration of minerals by magnetism? Write a short note on Magnetic Precipitator. (2+3+5+5)
7. Write down the principle of floatation. Enumerate different types of floatation. Which factors are utilized for the floatation process? (4+2+4)
8. What is classification? Deduce the terminal velocity for a mineral particle falling in a liquid column. Show the relation between free settling ratio and hindered settling ratio with example. (2+5+3)
9. Enumerate its merits and demerits over other gravity process. Enumerate four heavy medium liquids used in industrial separation. Write short notes on Norwalt Washer. (4+2+4)
10. With neat sketch narrate the principle of operation of a hydrocyclone. How do you determine feed rate and cut-point size of a hydrocyclone? Explain the full teeter phenomena. (5+3+2)